

From the INTERNATIONAL BUREAU

**PCT**

**NOTIFICATION OF ELECTION**

(PCT Rule 61.2)

To:

Commissioner  
US Department of Commerce  
United States Patent and Trademark  
Office, PCT  
2011 South Clark Place Room  
CP2/5C24  
Arlington, VA 22202  
ETATS-UNIS D'AMERIQUE  
in its capacity as elected Office

<b>Date of mailing (day/month/year)</b> 19 February 2001 (19.02.01)	
<b>International application No.</b> PCT/EP00/05203	<b>Applicant's or agent's file reference</b> K-P-4696-PC
<b>International filing date (day/month/year)</b> 07 June 2000 (07.06.00)	<b>Priority date (day/month/year)</b> 11 June 1999 (11.06.99)
<b>Applicant</b> KOPF, Daniel	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
03 January 2001 (03.01.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No.: (41-22) 740.14.35</p>	<p>Authorized officer R. E. Stoffel</p> <p>Telephone No.: (41-22) 338.83.38</p>
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# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>K-P-4696-PC</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/EP 00/ 05203</b>	International filing date (day/month/year) <b>07/06/2000</b>	(Earliest) Priority Date (day/month/year)
Applicant  <b>KOPF, Daniel</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

### 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☒ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1  
☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/05203

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G02B27/00 H01S3/08 G02B7/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01S G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 038 239 A (GABBERT MANFRED) 14 March 2000 (2000-03-14) figures 2-4	1-4
A	US 3 432 771 A (HARDY WILTON T) 11 March 1969 (1969-03-11) abstract	1-4
A	US 6 034 804 A (REINTJES JOHN ET AL) 7 March 2000 (2000-03-07) figure 1	1
	----- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\* &amp; \* document member of the same patent family

Date of the actual completion of the international search

4 July 2001

Date of mailing of the international search report

10. 07. 2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
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Authorized officer

Sarneel, A

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/05203

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SPUHLER G J ET AL: "Diode-pumped passively mode-locked Nd:YAG laser with 10-W average power in a diffraction-limited beam" OPTICS LETTERS, 15 APRIL 1999, OPT. SOC. AMERICA, USA, vol. 24, no. 8, pages 528-530, XP002160662 ISSN: 0146-9592 figure 2	1,5
A	US 5 825 562 A (LAI MING ET AL) 20 October 1998 (1998-10-20)	
X	US 5 936 785 A (DO KHIEM BA ET AL) 10 August 1999 (1999-08-10) column 7, line 61 -column 8, line 10; figure 9	9-11
X	US 5 737 132 A (F.S. LUECKE ET AL) 7 April 1998 (1998-04-07) column 3, line 40 -column 4, line 3; figure 4	9,11
A	WO 96 10699 A (UNIV RAMOT ;SHOSHAN HERBERT Z (IL); KIRYUSCHEVA IRINA (IL); MAROM) 11 April 1996 (1996-04-11) page 15, line 13 -page 16, line 2; figure 9	9,11
A	FR 2 659 258 A (PEUGEOT ;CITROEN SA (FR)) 13 September 1991 (1991-09-13) page 4, line 19 -page 6, line 15; figure 2	9
A	GB 2 305 232 A (PILKINGTON PERKIN ELMER LTD) 2 April 1997 (1997-04-02) abstract figure 1	9

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-8

An optical system for imaging a laser beam onto an optical material characterized by an ABCD matrix whereby D is substantially zero.

2. Claims: 9-11

Holder for an optical component

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP 00/05203

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/05203

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6038239	A	14-03-2000	DE 19515321 A AU 5647196 A DE 29607659 U DE 59601190 D WO 9633536 A EP 0829120 A JP 11503877 T	24-10-1996 07-11-1996 29-08-1996 04-03-1999 24-10-1996 18-03-1998 30-03-1999
US 3432771	A	11-03-1969	DE 1232673 B FR 1466424 A GB 1062856 A	05-04-1967 22-03-1967
US 6034804	A	07-03-2000	NONE	
US 5825562	A	20-10-1998	AU 8780398 A WO 9909445 A	08-03-1999 25-02-1999
US 5936785	A	10-08-1999	US 5852519 A	22-12-1998
US 5737132	A	07-04-1998	NONE	
WO 9610699	A	11-04-1996	IL 111124 A AU 3723895 A US 5859947 A	23-07-1996 26-04-1996 12-01-1999
FR 2659258	A	13-09-1991	NONE	
GB 2305232	A	02-04-1997	NONE	

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Daniel KOPF

Attn: PCT Branch

Application No. U.S. National Stage of PCT/EP00/05203

Filed: December 4, 2001

Docket No.: 111363

For: OPTICAL SYSTEM FOR LASERS

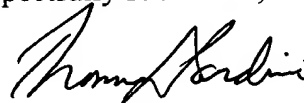
**SUBMISSION OF THE ANNEXES TO THE  
INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

Director of the U.S. Patent and Trademark Office  
Washington, D.C. 20231

Sir:

Attached hereto are the annexes to the International Preliminary Examination Report (Form PCT/IPEA/409). The attached material replaces the material in the claims.

Respectfully submitted,



James A. Oliff  
Registration No. 27,075

Thomas J. Pardini  
Registration No. 30,411

JAO:TJP/cmm

Date: December 4, 2001

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DEPOSIT ACCOUNT USE AUTHORIZATION Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461
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APR 34 AMDT

## CLAIMS:

## 1. Optical system for a laser comprising at least:

means for imaging a laser beam onto a first optical material (1,1b), which imaging means comprise

- 5           - at least one optical imaging system (2) for focusing said laser beam onto the first optical material (1,1b) and
- at least one optical means for changing the angle of the propagation axis of the laser beam, whereby the optical imaging system is positioned between the optical means and the first optical material, and may be described by a

$$\begin{pmatrix} AB \\ CD \end{pmatrix} - \text{matrix},$$

10           whereby D is substantially zero.

## 2. Optical system for a laser comprising at least:

second means for imaging a laser beam onto a second optical material (1c), which second imaging means comprise

- 15           - at least one further optical imaging system (2) for focusing said laser beam onto the second optical material (1c) and
- at least one optical means for changing the relative position of the propagation axis of the laser beam, whereby the further optical imaging system is positioned between the second optical means and the second optical
- 20           material, and may described by a

$$\begin{pmatrix} AB \\ CD \end{pmatrix} - \text{matrix},$$

whereby C is substantially zero

## 3. Optical system for a laser comprising at least:

first and second means for imaging a laser beam onto a first and a second optical material whereby the first imaging means comprise:

25

- at least one optical imaging system (2) for focusing said laser beam onto the first optical material (1,1b) and

- at least one optical means for changing the angle of the propagation axis of the laser beam, whereby the optical imaging system is positioned between the optical means and the first optical material, and may be described by a

$$\begin{pmatrix} AB \\ CD \end{pmatrix} - \text{matrix},$$

whereby D is substantially zero;

and whereby the second imaging means comprise

- at least one further optical imaging system (2) for focusing said laser beam onto the second optical material (1c) and

- at least one optical means for changing the relative position of the propagation axis of the laser beam, whereby the further optical imaging system is positioned between the second optical means and the second optical material, and may be described by a

$$\begin{pmatrix} AB \\ CD \end{pmatrix} - \text{matrix},$$

whereby C is substantially zero

4. Optical system according to claim 1, 2 or 3, used as a part of a laser resonator.

5. Optical system according to any one of the preceding claims, wherein the first and/or second optical material is a semiconductor saturable absorber.

6. Optical system according to any one of claims 1 through 4, wherein the first and/or second optical material is a nonlinear optical crystal used for frequency conversion such as second harmonic, third harmonic, multiple harmonic generation or optical parametric oscillation or amplification.

7. Optical system according to any one of the preceding claims, wherein the first and/or second optical material is LBO, BBO, KTP, CLBO or PPLN.

8. Optical system according to claim 3, used for generating ultraviolet light.

5

9. Holder for an optical component, preferably to be positioned onto an optical platform or the like, comprising

means for supporting the optical component which supporting means comprise four supporting points;

10

one recess for inserting the optical component;

one fixing means, for instance a screw for fixing the adjusted optical holder in the recess.

15

10. Holder according to claim 9, wherein the supporting points are shaped in the form of V-grooves.

11. Holder according to claim 9 or 10, wherein the recess is cylindrical.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



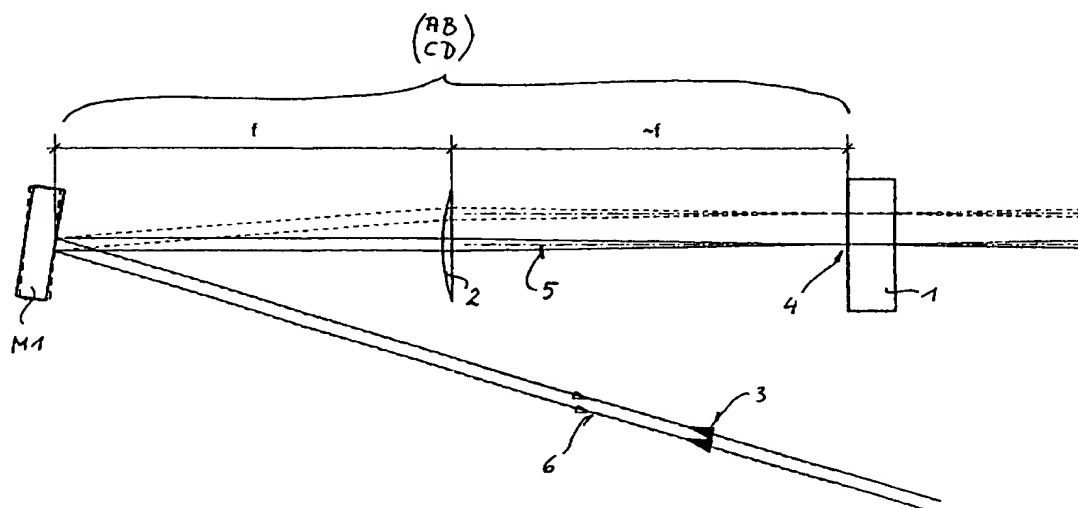
(43) International Publication Date  
21 December 2000 (21.12.2000)

PCT

(10) International Publication Number  
**WO 00/77890 A3**

- (51) International Patent Classification<sup>7</sup>: **G02B 27/00**, H01S 3/08, G02B 7/00 (74) Agent: KAMINSKI, Susanne; Büchel, Kaminski & Partner, Letzanaweg 25, FL-9495 Triesen (LI).
- (21) International Application Number: PCT/EP00/05203 (81) Designated States (national): JP, US.
- (22) International Filing Date: 7 June 2000 (07.06.2000) (84) Designated States (regional): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).
- (25) Filing Language: English
- (26) Publication Language: English Published: — with international search report
- (30) Priority Data: 60/138,895 11 June 1999 (11.06.1999) US (88) Date of publication of the international search report: 6 December 2001
- (71) Applicant and  
(72) Inventor: KOPF, Daniel [AT/AT]; Walgaustrasse 9, A-6832 Röthis (AT).
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: OPTICAL SYSTEM FOR LASERS



(57) Abstract: An optical system for a laser comprises at least means for imaging a laser beam onto a first optical material (1, 1b). These imaging means comprise at least one optical imaging system (2) for focusing said laser beam onto the first optical material (1, 1b) and at least one optical means for changing the angle of the propagation axis of the laser beam, whereby the optical imaging system is positioned between the optical means and the first optical material, and may be described by formula (I) whereby D is substantially zero.

WO 00/77890 A3

## PATENT COOPERATION TREATY

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REC'D 29 NOV 2001

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

3

Applicant's or agent's file reference K-P-4696-PC	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/05203	International filing date (day/month/year) 07/06/2000	Priority date (day/month/year) 11/06/1999
International Patent Classification (IPC) or national classification and IPC G02B27/00		
Applicant KOPF, Daniel		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 03/01/2001	Date of completion of this report 27.11.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Artelsmair, G Telephone No. +49 89 2399 8989 

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/05203

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):
- Description, pages:**

1-11 as originally filed

**Claims, No.:**

1-13 as received on 15/11/2001 with letter of 15/11/2001

**Drawings, sheets:**

1-7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP00/05203

☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

**see separate sheet**

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	1-10,12,13
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-10,12,13
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-10,12,13
	No:	Claims	

2. Citations and explanations  
**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**1 REGARDING ITEM I:**

New claim 11 states that the length of the touching surfaces is smaller than the distance between said touching surfaces. However, this feature is not directly and unambiguously derivable from the specification as originally filed, in particular not from figure 4.

**2 REGARDING ITEM VIII:**

- 2.1 It is clear from the description that the following features are essential to the definition of the invention:

(A) The optical material is a solid state material which degrades with time under light exposure;

(B) the means for changing the angle of the propagation axis are positioned at a distance away from the lens which corresponds exactly to the focal length of the lens.

Since independent claim 1 does not contain these features, and since independent claim 7 does not contain feature B they do not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

- 2.2 The terms "at least"; such as", may be", "preferably" or "for instance" used in claims 1 and 10, are vague and leave the reader in doubt as to the meaning and relevance of the technical features to which they refer, thereby rendering the definition of the subject-matter of said claims unclear (Article 6 PCT).
- 2.3 Claim 1 already defines that the nonlinear optical material is an optical crystal used for frequency conversion. Thus the corresponding paragraph of claim 6 is superfluous. What is worse, the other options mentioned in claim 6 (semiconductor, LBO ...) are in contradiction to claim 1 to which claim 6 refers.



**3 REGARDING ITEM V:**

3.1 The following remarks are made under the assumption, that the objections under item VIII have been overcome.

3.2 Nearest prior art is US-A-6034804 (D1). It describes a scanning system comprising means for imaging a laser beam onto an optical material (19), said means comprising an optical imaging system (13) for focusing said laser beam onto the optical material, and optical means (11) for changing the angle of the propagation axis of the laser beam, whereby the optical imaging system is positioned between the optical means and the optical material (see figure 1 and the corresponding description).

D1 does not describe the optical system by means of a matrix. However, the optical result of the claimed system is identical to the result achieved by the system according to D1, i.e. the spot of the laser beam on the material is shifted by adjusting the angle of the control means. This may be described by a matrix as in claim 1 or in explicit wording as in D1.

The other documents cited in the International Search Report only concern the general technological background or features of the dependent claims.

3.3 The subject-matter of claims 1 and 7 differs from what is described in D1 in that the optical system is part of a laser system comprising a material which has limited durability under light exposure. The object of the invention is to avoid the problems arising from the degradation of the nonlinear optical material by moving the spot across the material using an optical system as known from D1. Neither the problem, nor its solution is known from the available prior art. The solution cannot be regarded as obvious since D1 and the present invention deal with completely different problems. The problem underlying D1 is to improve the scanning optics using light produced by a laser. In contrast thereto the problem underlying the present invention is to improve the laser itself.

Thus the subject-matter of independent claims 1 and 7 includes an inventive step.

## Appendix 1: CLAIMS

1. Laser system for using nonlinear optical effects, such as generating ultraviolet light, comprising at least

a laser setup for generating a laser beam (3),

a nonlinear optical material (1a), such as a nonlinear optical crystal used for frequency conversion such as second harmonic, third harmonic, multiple harmonic generation or optical parametric oscillation or amplification,

an optical system with imaging means for imaging said laser beam (3) onto said nonlinear optical material (1a), which imaging means comprise

- at least an optical imaging system (2) for focusing said laser beam onto the nonlinear optical material (1a) and
- at least an optical means (M1) for changing the angle of the propagation axis of said laser beam (3),
  - o whereby said optical imaging system is positioned between said optical means (M1) and said nonlinear optical material (1a), and may be described by a

$$\begin{pmatrix} AB \\ CD \end{pmatrix} - \text{matrix},$$

whereby D is substantially zero.

2. Laser system according to claim 1 characterized in that said optical means (M1) is a part of a resonator of said laser setup.

3. Laser system according to claim 1 or 2 characterized in that said laser beam (3) is reflected back onto itself after passing said nonlinear optical material (1a).
4. Laser system according to claim 3 characterized in that said laser beam (3) is reflected back onto itself by a reflective surface (7a) on the back side of said nonlinear optical material (1a).
5. Laser system according to any one of the preceding claims comprising a dichroic mirror (9) or a polarizing beam splitter.
6. Laser system according to one of the preceding claims, wherein said nonlinear optical material (1,1b) is
  - o a semiconductor saturable absorber; or
  - o a nonlinear optical crystal used for frequency conversion such as second harmonic, third harmonic, multiple harmonic generation or optical parametric oscillation or amplification; or
  - o lithium borate (LBO), beta-barium borate (BBO), potassium titanyl phosphate (KTP), cesium lithium borate (CLBO) or periodically poled lithium niobate (PPLN).
7. Optical system for a laser system with an optical material (1,1b), which has limited durability under light exposure, comprising

at least first imaging means for imaging a laser beam (3) onto said first optical material (1,1b), which imaging means comprise

  - at least a first optical imaging system (2) for focusing said laser beam (3) onto said first optical material (1,1b) and

- at least a first optical means (M1) for changing the angle of the propagation axis of said laser beam (3),
  - o whereby said first optical imaging system is positioned between said first optical means (M1) and said first optical material (1,1b), and may be described by a

$$\begin{pmatrix} AB \\ CD \end{pmatrix} - \text{matrix},$$

whereby D is substantially zero; and

- o whereby said first optical means (M1) is a part of a resonator of said laser system.

8. Optical system according to claim 7 comprising

second imaging means for imaging said laser beam (3) onto a second optical material (1c) whereby the second imaging means comprise

- at least a second optical imaging system (2) for focusing said laser beam (3) onto the second optical material (1c) and
- at least a second optical means for changing the relative position of the propagation axis of the laser beam (3), whereby said second optical imaging system is positioned between said second optical means and said second optical material (1c), and may be described by a

$$\begin{pmatrix} AB \\ CD \end{pmatrix} - \text{matrix},$$

whereby C is substantially zero.

9. Optical system according to one of the claims 7 or 8, wherein said first optical material (1,1b) and/or said second optical material (1c) is
- o a semiconductor saturable absorber; or
  - o a nonlinear optical crystal used for frequency conversion such as second harmonic, third harmonic, multiple harmonic generation or optical parametric oscillation or amplification; or
  - o lithium borate (LBO), beta-barium borate (BBO), potassium titanyl phosphate (KTP), cesium lithium borate (CLBO) or periodically poled lithium niobate (PPLN).
10. Adjustable optical means for an optical system according to any one of the claims 1 through 9, comprising
- a optical component (12), such as a laser mirror or a nonlinear optical material, with one or two wedged surfaces (14) and
  - a holder for said optical component (12), preferably to be positioned onto an optical platform or the like, comprising
    - o means for supporting said optical component (12) which supporting means comprise four defined touching surfaces (11);
    - o one recess for inserting said optical component (12);
    - o one fixing means, for instance a screw (13a) for fixing said optical component (12) in the recess;

wherein said optical component (12) is rotatable around its axis in said recess.

11. Adjustable optical means according to claim 10, wherein the length of said defined touching surfaces (11) is smaller than the distance between said defined touching surfaces (11).
12. Adjustable optical means according to claim 10 or 11, wherein the defined touching surfaces (11) are shaped in the form of V-grooves.
13. Adjustable optical means according to claim 10, 11 or 12, wherein said optical component (12) and said recess are substantially cylindrical.